

# WEST VIRGINIA SPLATTER SEPTEMBER 2025



## Space Weather: How It Affects My Radio

Like weather here on earth, Space weather begins with the Sun. The Sun gives off electromagnetic energy in many wavelengths, including visible light, radio waves, ultraviolet, high energy X-rays, and more. The Sun also emits a stream of radiation in the form of charged particles (plasma) that make up the solar wind. Occasional energy bursts resulting from huge explosions on the Sun send plasma and radiation hurtling through our solar system, sometimes in the direction of Earth. Solar flares, coronal mass ejections (CMEs), and solar prominence events are examples of solar phenomena that can release these energy bursts toward Earth and create space weather storms.

Space weather is different from terrestrial weather. Terrestrial weather involves atmospheric conditions, temperature, humidity, and air pressure, that can cause storms with rain, snow and wind. Space has no water or air, so there is no precipitation. But there is wind — solar wind — that doesn't involve air movement. Solar wind is a stream of energy and plasma, or charged particles, from the Sun. These storms are invisible but still impact Earth.

As the solar wind flows past Earth, it mostly deflects around Earth's magnetosphere, the protective magnetic field that surrounds our planet. As these radiation particles collide with atoms in Earth's upper atmosphere, the resulting space weather storms can produce the Northern and Southern auroras. Space weather can also interfere with satellite electronics, **radio communications**, GPS signals, spacecraft orbits, and electrical power grids on Earth.

Solar flares emit X-rays, among other types of electromagnetic energy. Increased X-ray emissions can scatter **radio** waves as a result of disruptions to the ionosphere, causing **radio blackouts** on Earth. Radio blackouts can last for a few minutes to several hours and are the most common impact of space weather on Earth. We experience an average of 2000 radio blackouts during each 11-year solar cycle. The energy from solar flares reaches Earth in about eight minutes; so scientists continually monitor the Sun to get alerts out as soon as possible.

Solar radiation storms are caused by solar flares and coronal mass ejections. During a solar radiation storm, large bursts of protons and other particles from the Sun can increase the radiation levels near Earth to harmful levels with dangerous health effects for astronauts and airline travelers in polar regions. This increased energy can also damage satellite electronics and can interact with Earth's ionosphere to disrupt **radio communication** in polar areas. Radiation storms reach Earth within 10 minutes and its impact Earth for hours to days.

A coronal mass ejection sends a burst of solar particles and radiation toward Earth. Much of the energy is deflected around Earth due to our magnetosphere, but some interacts with our atmosphere causing geomagnetic and solar radiation storms.

A large coronal mass ejection can cause a strong gust of solar wind to reach Earth, transferring energy to Earth's magnetic field and causing a geomagnetic storm. These storms can create intense currents in Earth's magnetosphere and cause the ionosphere and upper thermosphere to heat up. The most common effects on Earth are the auroras, but they can also disrupt **radio** signals and navigation systems, create drag for low-orbiting satellites, and harm power grids. Geomagnetic storms typically take several days to reach the Earth so warnings can be issued well before they arrive. Their effects can last for several days.

Some spacecraft failures can be directly attributed to space weather; many more are thought to have a space weather component. For example, 46 of the 70 failures reported in 2003 occurred during the October 2003 geomagnetic storm. The two most common adverse space weather effects on spacecraft are radiation damage and spacecraft charging.

Radiation (high-energy particles) passes through the skin of the spacecraft and into the electronic components. Usually, the radiation causes an erroneous signal or changes one bit in memory of a spacecraft's electronics (single event upsets). In a few cases, the radiation destroys a section of the electronics (single-event latchup).

Spacecraft charging is the accumulation of an electrostatic charge on a nonconductive material on the spacecraft's surface by low-energy particles. If enough charge is built up, a discharge (spark) occurs. This can cause an erroneous signal to be detected and acted on by the spacecraft computer. A recent study indicated that spacecraft charging is the predominant space weather effect on spacecraft in geosynchronous orbit.

The orbits of spacecraft in low Earth orbit (LEO) decay to lower altitudes due to the resistance between the spacecraft's surface (*i.e.*, drag) and the outer layer of the Earth's atmosphere. Eventually, a LEO spacecraft falls out of orbit towards the Earth's surface. A geomagnetic storm can cause an orbit change over a few days that otherwise would occur over a year or more. The geomagnetic storm adds heat to the thermosphere, causing the thermosphere to expand and rise, increasing the drag on spacecraft.

The ionosphere bends **radio** waves the same way water in a pool bends visible light. When the medium through which such waves travel is disturbed, the light image or **radio** information is distorted and can become unrecognizable. The degree of distortion (scintillation) of a **radio** wave by the ionosphere depends on the signal frequency. **Radio** signals in the VHFband can be distorted beyond recognition by a disturbed ionosphere. **Radio** signals in the UHF band can transit a disturbed ionosphere, but a receiver may not be able to keep locked to the carrier frequency. GPS uses signals at 1575.42 MHz and 1227.6 MHz that can be distorted by a disturbed ionosphere. Space weather events that corrupt GPS signals can significantly impact society. Major space weather events can push the disturbed polar ionosphere 10° to 30° of latitude toward the equator and can cause large ionospheric gradients at mid and low latitude. Both of these factors can distort GPS signals.

**Radio** waves in the HF band are reflected by the ionosphere. Since the ground also reflects HF waves, a signal can be transmitted around the curvature of the Earth beyond the line of sight. During the 20th century, HF communications was the only method for a ship or aircraft far from land or a base station to communicate. Other methods of communications have been developed, but HF remains critical for vessels without the new equipment and is a critical backup for others. Space weather events can create irregularities in the ionosphere that scatter HF signals instead of reflecting them, preventing HF communications. At auroral and polar latitudes, small space weather events that occur frequently disrupt HF communications. At mid-latitudes, HF communications are disrupted by solar **radio** bursts, by X-rays from solar flares (which enhance and disturb the ionospheric D-layer) and irregularities during major geomagnetic storms).

Magnetic Storm Activity can induce geoelectric fields in the Earth's conducting lithosphere. Corresponding voltage differences can find their way into electric power grids through ground connections, driving uncontrolled electric currents that interfere with grid operation, damage transformers, trip protective relays, and sometimes cause blackouts. This complicated chain of causes and effects was demonstrated during the magnetic storm of March 1989, which caused the complete collapse of the Hydro-Quebec electric-power grid in Canada, leaving nine million people without electricity. Without electricity there is no radio communications. Another reason to invest in a generator.

The amount of energy entering the troposphere and stratosphere from space weather phenomena is trivial compared to the solar insolation in the visible and infrared portions of the solar electromagnetic spectrum. Although some linkage between the 11-year sunspot cycle and the Earth's climate has been claimed, this has never been verified. So far, no link between space weather and the climate has been demonstrated.

| NOTABLE SPACE WEATHER EVENTS |                                                                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| December 21, 1806            | Alexander von Humbolt observed that his compass had become erratic during a bright auroral event.                                                |
| 1859                         | The Carrington Event caused widespread disruption of telegraph service.                                                                          |
| November 17, 1872            | This Aurora event disrupted telegraph service.                                                                                                   |
| May, 1921                    | This geomagnetic storm, one of the largest on record disrupted telegraph service and damaged electrical equipment worldwide.                     |
| October 31, 2003             | The Halloween solar storms, a series of coronal mass ejections and solar flares in late October and early November 2003 with associated impacts. |

## SAVE THESE DATES!!!!

**Saturday, October 11, 2025-Wood County (WV) Area Hamfest**  
**Sunday, November 2, 2025-KARC Tailgate Hamfest at Coonskin**

### KYLEIGH'S KREATIONS

At the recent TARA (Huntington) hamfest I ran into a new vendor, New to me anyway. They had a number of personalized items on display, coffee cups, coasters and similar items with call signs and/or logos on them. I talked to Kyleigh and Roland Craft long enough to discover they create these items themselves. They are still developing their Facebook page so not much can be found there yet.

If you are looking for a personalized coffee cup, coaster, name tag, shirt, name badge license plate or other item contact them at [KcraftK16@gmail.com](mailto:KcraftK16@gmail.com). I liked what I saw so much I bought a couple of items to give as Christmas presents this year.

# BURUNDI DXPEDITION -- 9U1RU



There will be a DXpedition to the Republic of Burundi in Central Africa in November. A team of nine operators from four countries, Russia, Poland, The Czech Republic and the United States (including West Virginia's own Hal Turley, W8HC) will be QRV with at least seven high-power stations on all HF bands during twenty days. The goal is to work as many stations as possible. Team members will fly from Moscow, Prague and New York to Addis Ababa, Ethiopia. From there they will fly together to Bujumbura on October, 28.

On October 29 and 30 the nine will assemble their stations and antennas and do some limited operating. Full scale, on-the-air operation will begin on October 31 and will continue till November 17, 2025. There will also be limited operating on November 18 and 19 while the team takes down and packs up their stations.

They intend to operate FT8 on special frequencies at the beginning of their activity. Check the DX cluster to find out where. Later they intend to move to the usual FT8 sub-bands if the number of callers decreases. They will use MSHV software in their station (not SuperFox).

QSOs will be uploaded to ClubLog at least twice a day. Check your CFM on the ClubLog web-site. They will use "DXpedition Mode", so you can see all the statistics, including best time to work them us from our region. If you are not in the log, the best solution is to work them again. All missed QSOs/busted

callsigns, etc emails should go to: [rv6ali@yandex.ru](mailto:rv6ali@yandex.ru). They will be processed after the Dxpediton!

As with any DXpedition, this will be a financially demanding operation. Your support is greatly welcomed. It will help reduce the high costs of this trip. To donate through PayPal, go to the Dxpediton website at [9U1RU | Rudxt](http://9U1RU.Rudxt) and click on the donate tab and the PayPal button.



## LOPDI

At the recent ARRL West Virginia Convention I heard a new acronym "LOPDI". When I asked what it meant I was told "Let Other People Do It". I hope that sentiment is rare and grows rarer in the amateur radio community. I have long believed in: "If you see something that needs doing – DO IT!"

## BEING AN ELMER

I found the following item taped inside my Father's bible. I changed the word "teacher" to "Elmer" to make it more relevant to amateur radio. There was no indication where Dad got it.

*To be a profitable Elmer you must have a desire to teach, knowledge of the subject, ability to communicate, patience, a sense of humor and time to do a through job. Not all teaching is profitable.*

*William A. Ward said, "The mediocre Elmer tells. The good Elmer explains. The superior Elmer demonstrates. The great Elmer inspires.*

*If you are an Elmer, aim at inspiring your proteges. At the very least demonstrate what you are teaching.*

## BUFFALO FIFTH ANNUAL HAM RADIO SWAP MEET

The Buffalo Fifth Annual Ham Radio Swap Meet will take place on September 20, 2025 at the Leavitt Funeral Home, 801 Victor Street, Belpre Ohio. A car show is taking place there at the same time. The Grand Prize is a Yeasu FT-710 with speaker and monitor. I don't have a listing of other prizes. Tickets and more information is available at [www.Buffalo10MeterNet.Net](http://www.Buffalo10MeterNet.Net) or by calling Tony, KI8JK at (740) 591-6215.

## THE WILDERNESS PROTOCOL

The Wilderness Protocol is a **SUGGESTION** that those out of repeater range monitor standard simplex frequencies at 7 AM local time for five minutes and every three hours after that throughout the day. (7:00 to 7:05, 10:00 to 10:05, etc.). If a station has adequate power sources it is suggested they monitor the simplex frequencies for the first five minutes of every hour.

The primary frequency is 146.52 MHz. The secondary frequencies are: 52.525; 223.5; 446.0 and 1294.5 MHz. This suggestion was developed to facilitate communications for those hams traveling outside the regular repeater range. The Wilderness Protocol is only effective if a number of people use it.

*More information on the Wilderness Protocol can be found in the **QST** magazine for February 1994 page 100, April 1994 page 109 and May 1994 pages 103-104.*



## ***The Digital Library of Amateur Radio and Communications***

The Digital Library of Amateur Radio and Communications is a library of materials and collections related to amateur radio and early communications. The DLARC is funded by a significant grant from [Amateur Radio Digital Communications](#), a private foundation, to create a digital library that documents, preserves, and provides open access to the history of this community.

This free resource combines archived digitized print materials, born-digital content, websites, oral histories, personal collections, and other related records and publications. The goals of DLARC are both to document the history of amateur radio and to provide freely available educational resources for researchers, students, and the general public.

DLARC currently contains more than 160,000 items of radio history — newsletters, magazines, conference archives, books, audio and video. There are always gaps in the collection to be filled. To check out the Wantlist to see if you have any material to make DLARC even better go to their web page <https://archive.org/details/dlarc-wantlist>. To contribute content for this project, email kay at archive.org.

### **WEST VIRGINIA SPLATTER**

The West Virginia Amateur Radio Club has posted back issues of WV SPLATTER on their website at [www.wv8ar.com](http://www.wv8ar.com). I have decided to send out the WV Nets and WV Clubs listings as separate documents once each quarter rather than each month to reduce the number of pages sent out over and over. Corrections and updates to those items will be held until the next quarter.

I continually need more and different types of articles for WV SPLATTER. If you know of an event coming up in a couple of months, have an idea for an article you want to write, or something you want me to research and write about, then drop me an email at [nettlescreek@frontier.com](mailto:nettlescreek@frontier.com). I also need photos and artwork each month. Use the same address to submit email addresses for anyone you think might be interested in being on the WV SPLATTER Distribution List. They don't have to be in West Virginia, they don't even have to be a ham.

I was recently asked about including advertisements for ham gear in WV SPLATTER. Ads for ham radio equipment, tools, and related items are welcome. Get them to me by the fifteenth of the month and I'll include them in the next months WV SPLATTER.

73 and thanks to all.

Jim Hudson, KE8PNY

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